

Some Azoxy Compounds as Reagents for Cations S/075/60/015/006/003/018  
B020/B066

SUBMITTED: September 28, 1959

Card 4/4

5.3610

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SOV/79-30-2-57/18

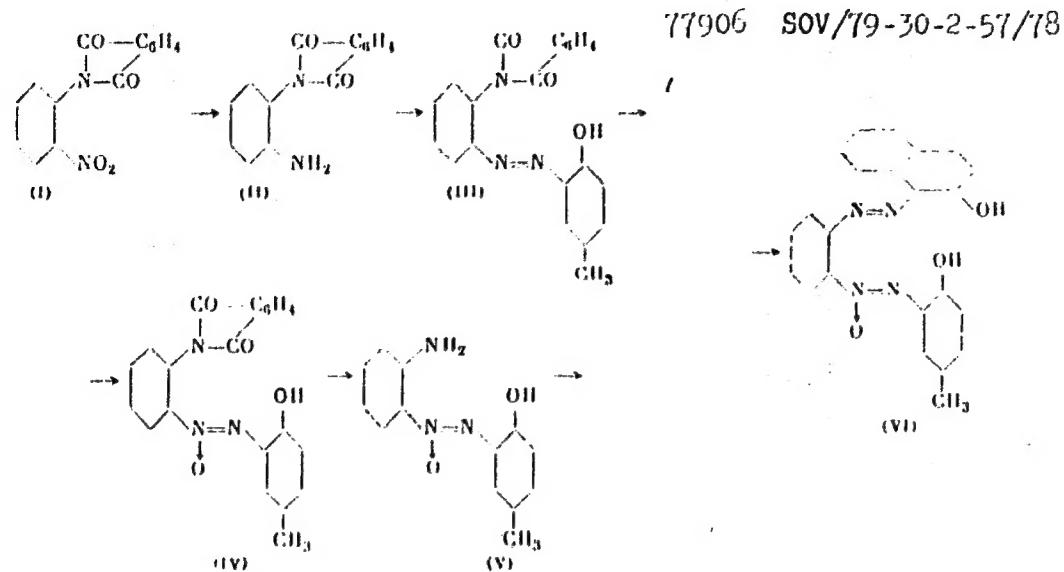
AUTHORS: Dziomko, V. M., Dunayevskaya, K. A.

TITLE: Synthesis of Chelating Agents of the Azoxy-Compounds Series. I. The First Representative of o,o"-Dihydroxy-o-Azoxy Compounds

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2,  
pp 628-632 (USSR)

ABSTRACT: Chelating agents with increased selectivity can be obtained from o-amino-o'-hydroxyazoxybenzene derivatives. The article describes the synthesis of this new compound and the new o,o'-dihydroxy-o-azoxy compound VI which was obtained as described in Fig. 1. Compound I was obtained on heating o-nitroaniline with phthalic anhydride in the presence of a small amount of nitrobenzene. Amine II was obtained on reduction of I with iron in aqueous acetone solution in the presence of acetic acid. Diazotization of II by the method

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Fig. 1.

Synthesis of Chelating Agents of the  
Azoxy-Compounds Series. I. The First  
Representative of o,o"-Dihydroxy-o-  
-Azoxy Compounds

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described by E. D. Berman and M. Bentov (J. Org. Ch., 1954, Vol 19, p 1594), and coupling with p-cresol in methanol gave the new 2-phthaloylamino-2'-hydroxy-5'-methylazobenzene (III; yield 56-61%; mp 160-162° C). The oxidation of III in glacial acetic acid with 30% hydrogen peroxide at 70-80° C gave new 2-phthaloylamino-2'-hydroxy-5'-methylazoxybenzene (IV; yield 57-61%; mp 154-155° C), which on hydrolyzation in methanol with hydrazine at 75-80° C yielded new 2-amino-2'-hydroxy-5'-methylazoxybenzene (V; mp 126° C). The latter (in filtrate obtained after the hydrolysis of IV) was diazotized with excess sodium nitrate. The excess was eliminated with urea. The coupling of V with 2-naphthol in 20% NaOH was made in an alkaline ( $Na_2CO_3$ ) medium. The dye thus formed was mixed with dilute (1:1) HCl, reprecipitated (by acidification of the alkaline alcohol solution), and recrystallized

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Synthesis of Chelating Agents of the  
Azoxy-Compounds Series. I. The First  
Representative of o;o-Dihydroxy-o-  
-Azoazoxy Compounds

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from benzene-butanol (1:1) mixture and from chloroform. The reaction gave new 2'-hydroxy-5'-methyl-benzene-(1'-azoxy-1)-benzene-(2-azo-1")-2-hydroxy-azobutadiene (VI; yield 13.2% based on IV; mp 229-230°C). Soaking VI in chloroform with aqueous solutions of Cu, Co, and Ca salts in an alkaline medium, changed the color of the chloroform layer from pinkish-orange to crimson for Cu, to brownish-purple for Co, and to colorless for Ca. Copper complex of VI was obtained on adding copper acetate monohydrate in dilute NaOH to VI in chloroform. After 1 hr stirring and 12 hr standing, the copper complex was washed with water and recrystallized from dioxane (VII; decomp. about 300°C). Light absorption curves of VII and VI were taken by M. P. Khoroshkova. There is 1 figure; and 7 references, 2 U.S., 1 Austrian, 4 German. The 2 U.S. references are: E. D. Bergmann, M. Bentov, J. Org. Ch., 19, 1594 (1954); ibid., 20, 1684 (1955).

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Synthesis of Chelating Agents of the  
Azoxy-Compounds Series. I. The First  
Representative of o,o-Dihydroxy-o-  
-Azoazoxyl Compounds

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SOV/79-30-2-57/78

ASSOCIATION: All-Union Scientific Research Institute for Chemical  
Reagents (Vsesoyuznyy nauchno-issledovatel'skiy  
institut khimicheskikh reaktivov)

SUBMITTED: February 20, 1959

Card 5/5

86508

53760 2209, 1282, 1308

S/079/60/030/011/014/026  
B001/B066AUTHORS: Dziomko, V. M. and Dunayevskaya, K. A.TITLE: Synthesis of Chelating Agents in the Series of Azoxy Compounds. II. A Novel Synthesis of 2-(2'-Amino-phenyl-azoxy)-4-methyl-phenol and Synthesis of 2-(2'-Bromo-phenyl-azoxy)-4-methyl-phenolPERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 11, pp.3708-3711

TEXT: The authors reported previously (Ref.1) on the synthesis of 2-(2'-amino-phenyl-azoxy)-4-methyl-phenol (III) by means of hydrazinolysis of 2-(2'-phthaloyl-amino-phenyl-azoxy)-4-methyl-phenol. They considered the papers (Refs.3,4) on the catalytic reduction of 2-nitro-phenyl-azoxy-benzene to 2-amino-phenyl-azoxy-benzene, and tried to apply this method to the azoxy compounds which may result on oxidation of 2-nitro-2'-hydroxy-5'-methyl-azo-benzene (I). In the oxidation of this compound (I) with peracetic acid, only one azoxy compound (II) was separated which gave the corresponding amine on reduction with hydrogen in the presence of platinum oxide, which was identified as 2-(2'-amino-phenyl-azoxy)-4-

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Synthesis of Chelating Agents in the Series S/079/60/030/011/014/026  
of Azoxy Compounds. II. A Novel Synthesis of B001/B066  
2-(2'-Amino-phenyl-azoxy)-4-methyl-phenol and Synthesis of 2-(2'-Bromo-  
phenyl-azoxy)-4-methyl-phenol

methyl-phenol (III). To confirm this structure, compound (III) was converted to 2-(2'-bromo-phenyl-azoxy)-4-methyl-phenol (IV) by Sandmeyer's reaction, which could be identified with the oxidation product of 2-bromo-2'-hydroxy-5'-methyl-azo-benzene (V). Both products are readily brominated with the theoretical bromine quantity, which also confirms the correctness of the suggested structures, in which the oxygen of the azoxy groups is bound to the nitrogen which is in ortho-position to the hydroxyl. There are 6 references: 1 Soviet, 3 British, and 2 Italian.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov (All-Union Scientific Research Institute of  
Chemical Reagents)

SUBMITTED: January 1, 1960

Card 2/2

DZIOMKO, V.M.

Extraction with the aid of two complex-forming substances.  
Dokl.AN SSSR 133 no.1:106-107 J1 '60. (MIRA 13:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov. Predstavлено академиком I.V. Тимануевым.  
(Extraction(Chemistry)) (Chelates)

S/020/60/134/005/C33/C35XX  
B016/B054

AUTHOR: Dziomko, V. M.

TITLE: Extraction With the Aid of Three Chelate Formers

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5,  
pp. 1091-1093

TEXT: The author reports on the observed cases of an extraction of colored compounds in the presence of three different chelate formers. He used the following reagents as chelate formers: 4-nitro-2,2'-dihydroxy-5'-methyl azobenzene (I), 4-nitro-2,2'-dihydroxy-4'-methyl-5'-isopropyl azobenzene (II), 8-hydroxyquinoline (III), 2-methyl-8-hydroxyquinoline (IV), 5-methyl-8-hydroxyquinoline (V), mono-n-butyl phosphate (VI), di-n-butyl phosphate (VII), N-nitroso-phenyl hydroxylamine (VIII), acetoacetic ester (IX), 2-carbethoxy cyclopentanone (X), 2-hydroxy acetophenone (XI), and benzoyl salicyloyl methane (XII). The extraction was carried out with chloroform. The extraction of colored (pink or violet) compounds was observed in the following cases at pH 10-12, and in the presence of three reagents: for scandium with combinations of II, VII, IX (or X); for

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Extraction With the Aid of Three Chelate Formers

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B016/B054

yttrium and rare earths with I, IV, XII; I(or II), IV (or V), VI; II, III (or IV or V), VII; II, III (or V), XI (or X); II, VII, IX (or X); for thorium with combinations of I, V, VIII; I, VII, XI; II, IV, VIII; II, III (or IV or V), VII; II, VII, IX (or X). In control tests where either the cation or one of the reagents, in succession, was left out, the extracts were colorless. With several combinations the colored complexes were not extracted, e.g. with II and IX in the case of rare earths, and with I and VIII in the case of scandium in the presence of IV; further with double combinations with I or II, and with the reagents IV, III, and V in the case of thorium. The reason for the anomalous behavior of IV may be a steric hindrance of the chelate former (Ref. 3). At pH values between 6 and 8, the orange-yellow color of I or II changed to the orange-red or red of the extracted complexes, so in the case of yttrium, rare earths, and thorium with the combination I, III (or IV or V), VI. In some cases, the color was both intensified and bathochromically shifted, as compared with double combinations, in the presence of the third chelate former. Special experiments of the author proved that the quantitative ratio of the reagents, particularly with relatively low concentrations, greatly influences the extractability of the corresponding colored compounds.

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Extraction With the Aid of Three Chelate Formers

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Thus, the selectivity of the extraction of colored compounds of rare earths could be much improved by a decrease in concentration of IV in the system I, IV, and XII at pH 10-12. As to the extraction mechanism, the author supposes that the reagents of type I and II, under given conditions, form chelate compounds in the presence of at least two donor groups, since the extracts have the color of the deprotonized form of the corresponding reagent. It is possible that, among the reasons for a selective extraction in the presence of three chelate formers, a certain role is played by the increase in specificity of the particles in the gradual chelate formation of tri- and tetravalent cations. There are 7 non-Soviet references.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy Institut khimicheskikh reaktivov (All-Union Scientific Research Institute of Chemical Reagents)

PRESENTED: June 2, 1960, by A. N. Frumkin, Academician

SUBMITTED: May 30, 1960

Card 3/3

DZIOMKO, V.M.

Extraction by means of two chelating agents. Zhur.VKHO 6  
no.1:108 '61. (MIRA 14:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov.  
(Chelating compounds)

DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.

Synthesis of chelants in the series of azoxy compounds. Part 3:  
New synthesis of 2-(2-aminophenylazoxy)-4-methylphenol and a more  
accurate determination of its structure. Zhur. ob. khim. 31 no.1:  
68-73 Ja '61. (MIRA 14:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktovov.  
(Azoxy compounds) (Chelating agents)

DZIOMKO, V.M.; MUNAYEVSKAYA, K.A.

Relationship between isomeric azoxy compounds formed in the  
oxidation of o, o'-disubstituted azo compounds. Zhur. ob. khim.  
31 no.10:3385-3393 O '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov.

(Azoxy compounds) (Azo compounds)

DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.

Synthesis of chelates in the azoxy compound series. Part 3: Synthesis  
of (6"-oxy-3"-methylphenylazoxy)-benzene-(2-azo-1)-2-naphthol.  
Zhur. ob. khim. 31 no. 11:3712-3714 N '61. (MIRA 14:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov.

(Azoxy compounds)

DZIOMKO, V.M.; KRASAVIN, I.A.

8-(p-Toluenesulfonylamino)-quinoline (8-p-tosylaminoquinoline).  
Metod.poluch.khim.reak.i prepar. no.4/5:67-69 '62. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i osobo chistykh khimicheskikh veshchestv.

KRASAVIN, I.A.; DZIOMKO, V.M.

8-(benzenesulfonylamino)quinoline. Metod.poluch.khim.reak.i prepar.  
no.4/5:69-71 '62. (MIRA 17:4)

1. V ooyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i osobu chistykh khimicheskikh veshchestv.

ROZINA, D.Sh.; DZIOMKO, V.M.; ROZENBERG, R.I.

Azotol 2,4 MK (3-carboxy(-2',4'-dimethylanilido)-2-hydroxynaphthalene). Metod.poluch.khim.reak.i prepar. no.4/5:103-105 '62.

2-Hydroxybenzene-(1-azo-1')-2'hydroxy-3'-(2",4"-dimethylcarboxyanilido)-naphthalene ("magon," "oban"). Ibid.:106-109

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobu chistykh khimicheskikh veshchestv.

DZIOMKO, V.M. (Moscow, Bogorodskiy val.d.3); DUNAYEVSKAYA, K.A. (Moscow, Bogorodskiy val.d.3)

Highly selective reagents among multidentate chelates. Acta  
chimica Hung 32 no.2:223-227 '62.

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov.

DZIOMKO, V.M.; MARKOVICH, I.S.

Synthesis of 2-(2'-aminophenyl)-8-hydroxy-4,5,7-trimethylquinazoline.  
Zhur. ob. khim. 32 no.5:1622-1626 My '62. (MIRA 15:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov.  
(Quinazoline)

VAYNSHTEYN, Yu.I.; DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.; SHIROKOVA, N.D.

Polarographic study of ortho-substituted azoxy compounds. Part 1.  
Zhur. ob. khim. 32 no. 9:2777-2782 S '62. (MIRA 15:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i osobo chistykh khimicheskikh veshchestv.  
(Azoxy compounds) (Polarography)

KRASAVIN, I.A.; PARUSNIKOV, B.V.; DZIOMKO, V.M.

8-hydrazinoquinoline and its hydrochloride. Metod. poluch. khim. reak.  
i prepar. no. 7:5-8 '63. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i osobu chistykh khimicheskikh veshchestv.

DZIOMKO, V.M.; KRASAVIN, I.A.; RADIN, Yu.P.

8-Acetoxyquinaldine. Metod.poluch.khim.reak. i prepar. no.7:  
8-10 '63. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i osobu chistykh khimicheskikh veshchestv.

DZIOMKO, V.M.; RUDENKO, N.P.; KREMENSKAYA, I.N.

Mixed thorium complex with cupferron and 4'-nitroso-2,2'-dihydroxy-4-methyl-5-isopropulazobenzene. Zhur.neorg.khim. 8 no.3:655-659 Mr '63.  
(MIRA 16:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i laboratoriya radiokhimii Nauchno-issledovatel'skogo instituta yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.  
(Thorium compounds) (Cupferron) (Azobenzene)

DZIOMKO, V.M.; RUDENKO, N.P.; KREMENSKAYA, I.N.

Determination of the composition of the complex thorium(IV)-cupferron-4'-nitro-2,2'-dixydroxy-4-methyl-4-isopropylazobenzene.  
Zhur.neorg.khim. 8 no.5:1278-1280 My '63. (MIRA 16:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh  
reaktivov i Nauchno-issledovatel'skiy institut yadernoy fiziki  
Moskovskogo gosudarstvennogo universiteta, laboratoriya radiokhimii.  
(Thorium compounds) (Cupferron)  
(Azobenzene)

DZIOMKO, V.M.; KRASAVIN, I.A.

Synthesis of pyrazole derivatives containing bidentate  
complex-forming groups. Trudy IREA no.25:41-46 '63.  
(MIRA 18:8)

DZIOMKO, V.M.; MARKOVICH, I.S.; ZELICHENOK, S.L.

Color reactions of quinazoline multidentate derivatives. Trudy  
IREA no.25:47-56 '63. (MIRA' 18:6)

DZIOMKO, V.M.; RUDENKO, N.P.; KREMENSKAYA, I.N.

Mixed cyclocomplex formation in the system thorium (IV) -  
cupferron - 4'-nitro-2,2'-dihydroxy-4-methyl-5-isopropyl-  
zobenzene. Trudy IREA no.25:172-182 '63.

(MIRA 18:6)

DZIOMKO, V.M.

New cases of the extraction of mixed chelates. Trudy IREA no.25;  
183-186 '63.  
(MIRA 18:6)

DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.

Synthesis of extraction agents forming colored mixed chelates.  
Trudy IREA no.25:187-190 '63.  
(MIRA 18:6)

L 18300-63 EWP(q)/EWT(m)/BDS AFFTC/ASD RM/JD/JG  
ACCESSION NR: AP3004943

S/0075/63/018/008/0937/0941

58  
58

AUTHORS: Dziomko, V. M.; Zelichenok, S. L.; Markovich, I. S.

TITLE: Photometric determination of lithium with a new reagent - Quinazolinazo

SOURCE: Zhurnal analiticheskoy khimii, v. 18, no. 8, 1963, 937-941.

TOPIC TAGS: dimethylformamide, Sr, Ca, Mg, Na, Ba, Al, Fe, Rb, Cs

ABSTRACT: A photometric method was developed for lithium determination with the aid of a new reagent 2-(4",5"-dimethylimidazole-2"-azo-2'-phenyl)-8-hydroxy-4,5,7-trimethylquinazoline. The coefficient of molar extinction of the product of interaction of the reagent with lithium in dimethylformamide is 12,840. The sensitivity of the reagent is 0.1  $\mu$ g of lithium in 5.75 ml of solution. Fifty times as much of Ca, Sr and Mg, 100 times as much of Na, Ba, Al and Fe, 200 times as much of Rb and Cs do not interfere with lithium determination. Curves presented include: The absorption curve of  $3.45 \times 10^{-5}$  M quinazolinazo solution depending on concentration of KOH in solution; dependence of photoabsorption of quinazolinazo and its lithium compound from KOH concentration in solution; luminous absorption curves of  $6.95 \times 10^{-5}$  M reagent solution and its lithium compound. Orig. art. has: 5 figures.

ASSN: AU SCI. RES. INST. CHEM. REAGENTS AND CHEM. SUBSTANCES OF SPECIAL

Card 1/2, PURITY.

LARIN, G.M.; DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.

Electron paramagnetic resonance of copper 2-(2"-hydroxynaphthalene  
[1"-azc-2"]-phenylazoxy)-4-methylphenolate. Zhur. strukt. khim. 5  
no.5:783-785 S-0 '64 (MIRA 18:1)

1. Institut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova  
AN SSSR i Institut khimicheskikh reaktivov i osobu chistykh  
veshchestv.

"APPROVED FOR RELEASE: 03/13/2001

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CIA-RDP86-00513R000411920011-2

KREMENSKAYA, I. N.; BRUDZ, V. G.; AVILINA, V. N.; IVANOV, O. V.; BZIOMAG, V. M.

"Physikalisch-chemische Untersuchung von Mikroverunreinigungen in nichtwassrigen nichtmischbaren Systemen der Chloride der IV. Gruppe."

report submitted for 2nd Intl Symp on Hyperpure Materials in Science and Technology, Dresden, GDR, 28 Sep-2 Oct 65.

All-Union Inst fur reine Reagentien und Reinststoffe, Moskau.

APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000411920011-2"

RULENKO, N.P.; DZIOMKO, V.M.; KREMENSKAYA, I.N.

Use of mixed chelate formation for concentrating thorium traces.  
Trudy Kom. anal. khim. 15:96-100 '65. (MIRA 18:7)

LARIN, G.M.; DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.; SYRKIN, Ya.K.

Electron paramagnetic resonance of some inner-complex compounds  
of copper (II). Zhur. struk. khim. 6 no.3:391-396 My-Je '65.

(MIRA 18:8)

I. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova  
AN SSSR i Institut khimicheskikh reaktivov i osoboi chistykh  
khimicheskikh veshchestv.

RUDENKO, N.P.; DZIOMKO, V.M.; KREMENSKAYA, I.N.

Method of separating Zr<sup>95</sup> from Nb<sup>95</sup> by the extraction of  
zirconium as a mixed complex with 8-hydroxyquinaldoxime  
and caproic acid. Radiokhimiia 7 no.4:492-494 '65.

(MIRA 18:8)

DZION, W; Dahlman, A.

Concerning the remarks of M. Domasik on the articles "The Problem of Spare Parts in the Repair of Building Machinery" and "The Production and Distribution of Spare Parts in Building Construction."

P. 31 (BUDOWNICTWO PRZEMYSLOWE) Poland, Vol. 1, No. 7, July 1957

SO: Monthly Index of East European Accessions (AEEI) Vol. 6, No. 11, November 1957

DZIONDZIAK, S.

Contribution to a discussion on the reinforced glass cutting machine. p.54. (SZKLO I  
CERAMIKA, Warszawa, Vol. 6, No. 3, Mar. 1955)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 6, June 1955,  
Uncl.

ATAULIN, V.V.; VLASOVA, R.M.; DAVYDOVA, Ye.A.; DANILENKO, I.S.; DZIOV, V.A.; DUBROVIN, A.P.; YEFANOVA, L.V.; KARPENKO, L.V.; KLEPIKOV, L.S.; KOTRELEV, S.V.; LUKIYANOV, N.I.; MEL'NIKOV, N.V., prof., obshchii red.; MKRTYCHAN, A.A.; NEMTINOV, A.M.; POGOSYANTS, V.K.; SEMIZ, M.D.; SKOBLO, G.I.; SLOBODCHIKOV, P.I.; SMIRNOV, V.M.; SUSHCHENKO, A.A.; SOKOLOVSKIY, M.M.; TRET'YAKOV, K.M.; FISH, Ye.A.; TSOY, A.G.; TSYPKIN, V.S.; CHEKHOVSKOY, P.A.; CHIZHIKOV, V.I.; ZHUKOV, V.V., red.izd-va; KOROVENKOVA, Z.L., tekhn.red.; PROZOROVSKAYA, V.L., tekhn.red.

[Prospects for the open-pit mining of coal in the U.S.S.R.; studies and analysis of mining and geological conditions and technical and economic indices for open-pit mining of coal deposits] Perspektivy otkrytoi dobychi uglia v SSSR; issledovanie i analiz gornogeologicheskikh uslovii i tekhniko-ekonomicheskikh pokazatelei otkrytoi razrabotki ugol'nykh mestoroshdenii. Pod obshchei red. N.V. Mel'nikova. Moskva, Ugletekhnizdat, 1958. 553 p. (MIRA 11:12)

1. Vsesoyuznyy tsentral'nyy gosudarstvennyy proyektnyy institut "Tsentrogradproshakht." 2. Chlen-korrespondent AN SSSR (for Mel'nikov).

(Coal mines and mining)

IZIOYEV, I.M., inzh.

Using hoisting machinery in building blast furnaces. Prom. stroi.  
37 no.4:57-62 Ap '59. (MIRA 12:6)

1. YuzhNII.

(Blast furnaces) (Hoisting machinery)

DEJIMSKI, M.

Solving some problems placed by practice. p. 83.

AMERISKI PRVLED. (Ministerstvo na naradnata obrana) Sofia, Czechlovakia.  
Vol. 5, no. 6, 1952.

Monthly List of East European Accessions (EEAI), LC, Vol. 9, No. 2, Feb. 1960  
Uncl.

DZIRKALIS, R.

Wide outlook for swine raising!

p. 1 (Padomju Latvijas Kolchoznieks) Vol. 9, No. 6, Aug. 1957. Riga, Latvia

SO: Monthly Index of European Accession (EEAI) LC,-Vol. 7, No. 1, Jan. 1958

DZIS', G.V. [Dzis', H.V.]; KUZNETSOV, K.M. [Kuznetsov, K.M.]

Production potentials of the light industry of the Ukrainian S.S.R.  
Leh.prom. no.2:3-6 Ap-Je '65. (MIRA 18:10)

VASILENKO, A.G.; NOGACHEVSKIY, I.I.; DZIS', I.P.

Interrelations of autoinfection and leukopenia and connective  
tissue mast cell reactions in radiation injury. Med. rad. 5  
no.12:72-73 '60, (MIRA 14:3)  
(RADIATION SICKNESS) (LEUKOPENIA)  
(MAST CELLS)

KISIN, S.V., prof.; DZIS', I.P., assistant

Rare case of combination of bilateral polycystic kidney with atresia  
of the ureters, paranephric cyst, and ascites in a newborn child.

Ped., akush. i gin. 22 no.4:2 of cover '60. (MIRA 14:5)

(KIDNEYS--DISEASES) (ASCITES)

(URETERS--ABNORMITIES AND DEFORMITIES) (CYSTS)

(INFANTS (PREMATURE))

DZIS', I.P.

Reaction of the cellular elements of porous connective tissue  
of white mice in experimental salmonellosis. Arkh. pat. 23 no.2:  
29-33 '61. (MIRA 14:2)

(SALMONELLA) (CONNECTIVE TISSUE)

PETROV, D.G.; SAVCHIK, A.B.; DZIS', I.P.; BAYDAK, V.I.

Morphological and biochemical changes in homologous skin following  
thermal treatment with formalin. Gemat. i perel. krovi 1:156-160  
'65. (MIRA 18:10)

1. Lvovskiy institut perelivaniya krovi.

DZIS', G.V. (Dzys', H.V.), inzh.-mekhanik

How we mechanized the preparation of peat-mineral composts. Mekh. sil'.  
hosp. 11 no.7:24 J1 '60. (MIRA 13:10)

1. Pervyy sekretar' Olishevskogo raykoma Kommunisticheskoy partii  
Ukrainy, Chernigovskoy oblasti.  
(Compost)

MASIK, M.G., dotsent; DZIS', I.P.

Spontaneous rupture of the spleen in acute aleukemic myelosis. Vrach.  
delo no.10:113-114 0 '60. (MIRA 13:11)

1. Kafedra propedevticheskoy terapii (zav. - dotsent M.G.Masik)  
i kafedra patologicheskoy anatomii (zav. dotsent N.I.Val'chuk)  
Teropol'skogo meditsinskogo instituta.  
(Marrow--DISEASES)  
(SPLEEN--RUPTURE)

DZISHKARIANI, A.V.

Estimates of the error of the Ritz method for proper values and proper functions of a differential equation. Soob. AN Gruz. SSR  
25 no.1:11-18 J1 '60. (MIRA 13:10)

1. Akademiya nauk Gruzinskoy SSR Tbilisekiy matematicheskiy institut  
im. A.M.Razmadze. Predstavleno chlenom-korrespondentom Akademii  
nauk N.P.Vekua.

(Differential equations)

DZISIENSKI, Z.

Equipment for grinding self-centering jaws for lathes. p.314.  
MECHANIK (Stowarzyszenie Inżynierów i Techników Mechaników Polskich) Warszawa  
Vol. 28, no. 8, Aug. 1955

So. East European Accessions List Vol. 5, No. 9 September 1956

DZISIĘWSKI, Z.

DZISIĘWSKI, Z. The development of the tool industry according to the 5-Year Plan. p. 274. Vol 29, no. 7, July 1956. MECHANIK, Warszawa, Poland.

DZISIOW, F.  
5907

Physiol. Inst. of the Med. Faculty, Univ. of Lodz Intravenous glucose transformation during severe muscular exercise in normal dogs Proceedings of the Society for Experimental Biology and Medicine 1948, 68/3 (549-550)

With an injection rate of 4 g./kg/hour glucose elimination by dogs performing work becomes inappreciable towards the end of the experiment, whereas in resting animals even with a rate of 2 g/kg/hour such an improvement of glucose utilization is not achieved.

Gottschalk - Melbourne

SO: EXCERPTA MEDICA, Vol. II, No. 11, Sec. II, Nov. 1949

DZISIOW, Ferdynand

Effect of muscular work on glycemic curve in cases of primary chronic rheumatism. Polskie arch. med. wewn. 27 no.3:311-317 1957.

1. Z Instytutu Reumatologicznego: Dyrektor: prof. dr. med. E. Reicher Oddział Kraków: Dyrektor: prof. dr. med. A. Sabatowski. Kierownik dsiału klinicznego: prof. dr. med. A. Sokolowski. Adres autora: Krośno nad Wisłokiem, ul. W. Proletariatu 6.  
(ARTHRITIS, RHEUMATOID, blood in,  
sugar, eff. of exercise (Pol))  
(EXERCISE, effects,  
on blood sugar in rheum. arthritis (Pol))

DEKISIOW, Ferdynand.

Investigations on assimilation of dextrose by muscles of the forearm in chronic rheumatism. Pat. polska 6 no. 4:267-279 Oct-Dec 55.

1. Z Instytutu Reumatologicznego w Warszawie. Dyrektor: prof. dr. B. Reicher, Oddział Krakow. Dyrektor: prof. dr. A. Szabatowski. Kierownik Oddziału Klinicznego: doc. dr. A. Sokolowski.

(ARTHRITIS, RHUMATOID, metabolism in, muscle, glucose assimilation (Rus))

(MUSCLES, metabolism, glucose assimilation in rheum. arthritis (Rus))

(GLUCOSE, metabolism, muscle, assimilation in rheum. arthritis (Rus))

EXCERPTA MEDICA Sec 6 Vol 13/10 Internal Med Oct 50

5940. RESEARCHES ON THE METABOLISM OF CARBOHYDRATES IN RHEUMATOID ARTHRITIS - Dzielew F. State Inst. of Rheumatol., Warsaw; Cracow Branch, Clin. Dept., Cracow - ACTA RHEUM. SCAND. 1958, 4/3 (193-199) Graphs 4

After oral administration of glucose the rheumatoid arthritis patients show a delay in the return to initial values. The difference between the blood sugar in the capillaries and the veins is considerably below normal figures in the patients while resting as well as during work. Moderate effort in the fasting state provokes hyperglycaemia. These deviations can be accounted for by a disturbance in the neuro-vegetative balance.

100  
1ST AND 2ND COPIES  
PROCESSES AND PROPERTIES INDEX

A physicochemical study of development and developers. I. Hydroquinone. V. O. DUKKO, M. V. BONDARENKO AND E. N. GAPON. *Ukrainski Khem Zhur*, 5, Sci 14, 205-207 (1930). —The process of development was studied in detail with special attention to the influence of temp. on the speed of reaction. Hydroquinone was used, and the procedure was to mix equal quantities of 0.1 N  $\text{KBr}$  and  $\text{AgNO}_3$  to which hydroquinone soln. was added with different concns. and at different temps. The time was controlled by addn. of  $\text{HNO}_3$ , and after filtration  $\text{Ag}$  was detd. in the filtrate by titrating with  $\text{KCNS}$ . A special test proved  $\text{KNO}_3$  did not affect the speed of reaction. The temp. is directly proportional to the degree of development. An effort is made to prove by formulas, supported with exptl. data, that development in the presence of hydroquinone is a heterogeneous monomol. reaction between  $\text{Ag}$  and  $\text{AgBr}$ , in which the speed const. of development does not depend on the concn. of developer. The primary reaction is completed in the first 60-180 min., after which side reactions take place.  $25^\circ$  was found to be the most favorable temp. for the reaction where actual results come nearest to the theoretical. II. Dependence of speed and the developing power upon the temperature. V. O. DUKKO AND E. N. GAPON. *Ibid* 309-12. —This work proves that the final amt. of developed  $\text{AgBr}$  increases with the temp. The speed const. of development between  $0^\circ$  and  $25^\circ$  increases with the temp. according to the law of Arrhenius, and between  $25^\circ$  and  $45^\circ$  is practically independent of the temp. The formula worked out by the authors for calcg. the percentage of developed  $\text{AgBr}$  at different temps. and time is valid only between  $25^\circ$  and  $45^\circ$ . III. Influence of sodium sulfite. *Ibid* 313-5. —The developing power of hydroquinone is little affected by change in concn. of  $\text{Na}_2\text{SO}_3$ . However, complete removal of  $\text{Na}_2\text{SO}_3$  decreases its developing power. I. NARANOVICH

ASG-51A METALLURGICAL LITERATURE CLASSIFICATION

2A  
5

RAYNOCHEMICAL STUDY OF THE PROCESS OF DEVELOPMENT AND THE DEVELOPERS. IV.  
V. O. DANILOV AND R. N. GARIN. *J. Russ. Chem. (U. S. S. R.)* 1, 1170-1173 (1931); cf. *C. A.*  
25, 16164. The reducing powers of pyrocatechol, of hydroquinone and of metal were  
studied at 28° as described in the earlier articles. Metal was the most efficient, hydro-  
quinone being next. Similarity was sought between the development and crystal by  
observing the diffusion development. A glass tube filled with sensitive emulsion was  
exposed to light and then immersed in the developer in the dark; the characteristic  
layers of the diffusion development were produced. The work is to be continued.  
PRO. NARKEVICH

COPPER ELEMENTS

MATERIALS INDEX

## PROCESSES AND PROPERTIES INDEX

2

The function of carriers in heterogeneous catalysis. I. Oxidation of arsenious oxide on charcoal bearing copper oxide. I. E. ADADUROV AND V. A. DZYAKO. *J. Phys. Chem. (U. S. S. R.)* 3, 450-55 (1932).—Addition of CuO to the catalyst increased the conversion of  $As_2O_3$  to  $As_2O_5$  from 7% to 31% with inactive charcoal, and from 42% to 98% with activated charcoal. II. Dehydrogenation of ethyl alcohol. I. E. ADADUROV AND P. YA. KRAUSS. *Ibid* 406-506.—The conversion of  $EtOH$  to  $CH_3CHO$  by charcoal surfaces at 250° begins only after 2 Cu atoms are present for each C atom and then increases very rapidly to 84% on pure Cu. For the at. ratios, Cu:C, 2.8, 4.8 and = the heats of activation are, resp., 37.7, 28.0 and 17.0 cal. F. H. RATHMANN

DZIS'KO, V. A.

USSR/Chemistry- Silica, Colloidal .  
Chemistry- Absorption

May 1948

" Influence of the Conditions of Preparation on the Structure of Silica Gel," G. K. B oreskov, M. S. Borisova, O. M. Dzhigit, V. A. Dzis'ko, V. P. Dreving, A. V. Kiselev, O. A. Likhacheva, Moscow S tate U imeni M. V. Lomonosov, Phys Chem Inst imeni L. Ya. Karpov, Moscow, 14 pp

" Zhur Fiz Khim" Vol XXII, No 5

S amples of various types of silica gel (vitreous, chalky, etc.) obtained by different methods and their absorbent properties compared. Results are tabulated and shown graphically. Submitted 14 Aug 1947.

PA 68T24

DZISKO, V. A.

Oct 48

USSR/Physics  
Silica Gels  
Temperature

"Effect of the Ignition Temperature on the Structure of Silica Gels," G. K. Boreskov, M. S. Borisova, V. A. Dzis'ko, A. V. Kiselev, O. A. Likhacheva, T. N. Morokhovets, Moscow State U imeni M. V. Lomonosov, Physicochem Inst imeni Karpov, 3 2/3 pp

Dokl Ak Nauk SSSR Vol 62, No 5

Three types of silica gel prepared: 1, glasslike samples with fine pores; 2, glasslike samples with uniformly coarse pores; and 3, chalklike samples of mixed porosity. Tests of adsorption and of desorption of methyl alcohol vapors yielded isotherms showing that 12-hour periods of ignition temperatures from 115° to 1,000°C affected samples' adsorption properties differently. Fine-pore glasslike samples were least stable thermally. Chalklike samples showed highest stability. Submitted by Acad M. M. Dubinin, 11 Aug 48.

Pa 53/49T99

CH  
C A

Porosity and activity of catalysts. I. Hydrolysis of chlorobenzene on silica gels of various structures. G. E. Borekov and V. A. Dzit'ko (Karpov Phys.-Chem. Inst., Moscow). Zhur. Fiz.-Khim. 24, 1135-46 (1950).—The relation between catalytic activity and catalyst porosity was studied on various samples of silica gel with the following characteristics (wt. of unit vol. of catalyst, pore vol., sp. surface area, av. pore radius): (I) 0.83 g./cc., 0.31 cc./g., 3200 sq. m./g., 10 Å.; (II) 0.64 g./cc., 0.81 cc./g., 640 sq. m./g., 18-20 Å.; (III) 0.49 g./cc., 0.8 cc./g., 400 sq. m./g., 32-40 Å. The prem. of the catalysts was described previously (C-4, 42, 71-32d.). The kinetics was studied in a flow system. The pressure was maintained const. between 100 and 150 mm. Before each run, lasting 4-6 hrs., fresh catalyst was used. PhOH and HCl were sampled and titrated at 20-min. intervals. All catalysts lose their activity more or less rapidly; this deactivation is more pronounced the higher the temp. or the finer the pores. Since all catalysts were preheated at temps. higher than the ones prevailing during the reaction, the activity decrease was due to stopping of the pores by carbonaceous material. The kinetic law is found by changing the concn.  $c$  of PhCl between 0.9 and 14% H<sub>2</sub>O is present in excess. There is a linear relation between  $\log c$  and the contact time  $t$ . The slope of the straight lines is 0.6 so that either  $-dc/dt = h_1 c^{0.6}$  or  $-dc/dt = h_2 c^{1.0}$  where  $c_1$  is the product concn. Since  $h_1$  is more nearly const. than  $h_2$  for  $c$  between 13 and 16%, the 1st law is preferred for the calcns. For all catalysts, the Arrhenius plot ( $\log h_1$ , 1/T) consists of 2 straight lines. The break in the Arrhenius line occurs, however, at different temps. for different catalysts, viz., 525° for I, 800° for II, and 883° for III. At these temps. the activation energy  $E$  (in kcal.) changes from 50.0 to 17.0 (I), from 40.7 to 24.3 (II), and from 50.0 to 36.2 (III). The higher  $E$  corresponds to the kinetic range, the lower  $E$  to the diffusion range. The activity per unit surface is the same for all catalysts in the kinetic range but varies from catalyst to catalyst in the diffusion range owing to different pore structures. In the latter range, the internal surface is less fully utilized and this effect is more pronounced for catalysts with finer pores. A coeff. of utilization of the internal surface is calc'd. for the 3 catalysts on the assumption that diffusion into the pores is the rate-detg. step at high temp. The activity per unit surface can be thus calc'd. for various temps. in the diffusion range. The good agreement with the observed values substantiates the role attributed to the porous structure of a catalyst.

Michel Boudart

DEJS'KO V. A.

Dec 50

USSR/Chemistry - Catalysis

"Effect of Thermal Processing on the Catalytic Activity of Silica Gel," V. A. Dzis'ko, A. A. Vishnevskaya, V. S. Chesarova, Physicochem Inst imeni L. Ya. Karpov, Lab of Tech Catalysis, Moscow

"Zhur Fiz Khim" Vol XXIV, No 12, pp 1416-1419

Calcined 2 glassy forms of silica gel of uniform porosity and 1 chalky form with nonuniform porosity and temperatures up to 1900°C. Structural water decreased with temperature. Degree of covering of surface by hydroxyl groups was independent of temperature. Catalytic activity in vapor-phase

170716

Dec 50

USSR/Chemistry - Catalysis (Contd)

hydrolysis of chlorobenzene decreased rapidly for glassy forms, more slowly for chalky form, latter retaining sufficient activity up to 1900°. Specific catalytic activity was independent of temperature for glassy forms, increased slightly with temperature for chalky form.

170716

"The Effect of Heat Treatment on the Structure and Catalytic Activity of Aluminum Oxide." G. K. Boreiskov, V. A. Dzis'ko, M. S. Borisova, V. N. Krasnopol'skaya, Phys Chem Inst imeni L. Ya. Karpov, Moscow

"Zhur Fiz Khim" Vol. XVI, No 4, pp 492-499

Heating for 24 hrs at temps up to  $600^{\circ}$  does not change the surface and porosity of samples in comparison with those treated at  $450^{\circ}$ . At higher temps there are reduction of surface and changes of pore structure involving formation of larger pores.

(1)

217723

The surface reduction proceeds much more rapidly than the decrease in pore vol. Samples of different initial pore structure exhibit different resistance to high temps, those with the finest pore structure being the most strongly affected. Although the total catalytic activity is lowered as a result of heat treatment, the specific activity (activity per unit of surface) is increased to some extent if the temp of treatment is below  $1,200^{\circ}$ . The reason is the effect exerted on int diffusion. The activity of a sample heat-treated at  $1,000^{\circ}$  is increased, because fine pores the surface of which remains unused in catalysis

(2)

217723

Dzis'ko, Krasnopol'skaya

disappear at  $1,000^{\circ}$ . This does not happen at lower temps. The specific activity of gamma-Al<sub>2</sub>O<sub>3</sub> is not affected by the temp of heat treatment and does not depend on crystal size; only transformation into alpha-Al<sub>2</sub>O<sub>3</sub> changes the nature of the surface. The data on catalytic activity are based on the reaction of ethyl sic dehydrogenation.

(3)

217723

DZTSIKO, V. A.

Effect of sodium hydroxide on the catalytic activity of aluminum oxide in relation to the decomposition of ethyl alcohol. G. K. Boreskov, V. A. Dais'ko, and M. S. Borisova (L. Ya. Karpov Phys.-Chem. Inst., Moscow). Zhur. Fiz. Khim. 27, 1172-5 (1953); cf. C.A. 47, 214. — The progressive poisoning of  $\text{Al}_2\text{O}_3$  catalysts by NaOH was investigated. Samples of  $\text{Al}_2\text{O}_3$  prepd. in 4 different ways were made to absorb various amts. of NaOH from soln., then dried and kept 1 hr. at 450°. The catalytic activity of each sample was detd. from the amt. of  $\text{C}_2\text{H}_4$  produced when EtOH was passed over it at 420°. The total adsorption surface was detd. by means of a sorption balance with

MeOH as the adsorbate. Sp. gr., vol. of micropores in cc./g., total surface in sq. m./g. and sq. m./cc., and total and specific catalytic activities of each of the initial samples are tabulated. The rate const. for the formation of  $\text{C}_2\text{H}_4$  is shown graphically as a function of the amt. of adsorbed NaOH in millimoles/g. for each type of sample. The relative rate consts. are plotted as functions of the no. of millimoles of adsorbed NaOH per sq. cm. of adsorbing surface. The pore size and total surface of  $\text{Al}_2\text{O}_3$  are unchanged by the NaOH treatment. The catalytic activity decreases as the amt. of adsorbed NaOH increases, most rapidly for the smallest amts. of NaOH. This probably corresponds to adsorption of NaOH mols. on active groups of the surface. It is concluded that the active regions comprise 5-10% of the total surface of the  $\text{Al}_2\text{O}_3$  samples. The no. of active centers per unit surface depends on the purity of the sample and not on the manner of its prepn. J. W. L., Jr.

DZIŠ'KÓ, V. A.

9

Chemical Abstracts  
May 25, 1954  
General and Physical  
Chemistry

Effect of ignition temperature on the extent of surface and  
on the water content of the oxides of aluminum and magnesium.

G. K. Borekov, V. A. Dziskó, and M. S. Borisova  
(L. Ya. Karpov Phys.-Chem. Inst., Moscow). *Zhur. Fiz. Khim.* 27, 1176-82 (1953); *J. C. S.* 47, 907. --In an investigation of the mechanism of catalysis in oxides the water content of  $\text{Al}_2\text{O}_3$  and  $\text{MgO}$  was determined. The temp. of a sample of  $\text{Al}_2\text{O}_3$  in vacuum was raised from 100 to 1200° during a 100-hr. period. The evolved  $\text{H}_2\text{O}$  was weighed by means of a sorption balance. The  $\text{Al}_2\text{O}_3$  contained 17, 4.5, 1.1, and 0.5%  $\text{H}_2\text{O}$  at 20, 200, 400, and 1200°, resp. The surface was 215, 235, 127, and 10.5 sq. m. per g. at 150, 800, 1000, and 1200°, resp. On similar treatment  $\text{Mg}(\text{OH})_2$  was entirely converted to  $\text{MgO}$  below 370°; the rate of conversion was max. at 200°. The  $\text{H}_2\text{O}$  content and the surface of  $\text{MgO}$  at 400, 800, and 1000° were 2.0, 0.38, and 0.01 sq. m. per g., resp., and 347, 86, and 11 sq. m. per g., resp. In both oxides, the water appears to be held in solid soln. above 400°. Exptl. data are tabulated and graphed. J. W. L. [Signature]

DZIS'KO, V. A.

USSR/Chemistry - Decomposition

Card 1/1

Authors : Boreskov, G. K., Dzis'ko, V. A., and Yasevich, N. P.

Title : Effect of the composition of alumo-silicic catalysts on their activity in the process of ethyl alcohol decomposition

Periodical : Zhur. Fiz. Khim., 28, Ed. 5, 837 - 842, May 1954

Abstract : Experiments were conducted to determine the effect of the composition of alumo-silicic catalysts on their activity and selectivity in the process of ethyl alcohol decomposition. The activity relative to one aluminum atom on the surface is approximately the same for all investigated samples and does not depend upon the  $Al_2O_3$  concentration in the catalyst. Results also indicate that the relation between the activity and composition of aluminosilicic catalysts during the dehydration of the alcohol is entirely different from the relation existing during cracking, isomerization and other hydrocarbon conversion processes. Nine references: 5-USSR, 3-English and 1-USA. Tables, graphs, drawings.

Institution : The L. Ya. Karpov Physico-Chemical Institute, Moscow

Submitted : Aug. 18, 1953

DZIS'KO, V. A. ~~Effect of the porous structure of catalysts on their reaction selectivity~~

USSR/Chemistry Physical chemistry

Card : 1/1

Authors : Boreskov, G. K., Dzis'ko, V. A., and Borisova, M. S.

Title : Porous structure of catalysts and its effect on their reaction selectivity

Periodical : Zhur. fiz. khim. 28, Ed. 6, 1055 - 1066, June 1954

Abstract : Two cases of series reactions of the first order were investigated to determine the effect of porous structure of catalysts on their reaction selectivity. The rate of diffusion transfer, toward the internal surface of the catalyst grains and its effect on reaction selectivity, was also considered. The selectivity dependence upon the rate of diffusion was determined by criteria expressing the relation between the rate of chemical conversion and diffusion transfer for the basic substance and intermediate product. Four USSR references. Graphs.

Institution : The L. Ya. Karpov Physico-Chemical Institute, Moscow

Submitted : August 18, 1953

S/195/60/001/001/005/007  
B015/B050

5.1190

AUTHORS: Dzis'ko, V. A., Borisova, M. S.

TITLE: Effect of the Acidity of Catalysts on Their Catalytic Activity I. Polymerization of Isobutylene<sup>11</sup>

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 1, pp. 144-152

TEXT: The authors studied the relationship between the acidity and the catalytic activity of the following oxide catalysts:  $ZrO_2 \cdot SiO_2$ ,

$Al_2O_3 \cdot SiO_2$ ,  $B_2O_3 \cdot Al_2O_3$ ,  $MgO \cdot SiO_2$ , and  $H_3PO_4$  on  $SiO_2$ . The acidity and the number of acid parts were determined by using the indicator method and eight different indicators with  $pK$  from +6.8 to -8.2 (Table 1). The catalyst samples investigated were hydrated under standard conditions. Pure and mixed oxide catalysts were tested (Table 2), and it was found that the maximum acidity was not dependent on the concentration of the acid component in the mixed catalyst. The acidity function  $H_o$  varied from +4 to -8.2. The effect of acidity on the catalytic activity was investigated in the range from  $H_o = -3$  to -8 on the polymerization of

Card 1/3

X

82655

Effect of the Acidity of Catalysts on Their  
Catalytic Activity I. Polymerization of  
Isobutylene

S/195/60/001/001/005/007  
B015/B060

isobutylene in a circulation apparatus (Fig. 3) at a circulation rate of about 800 l/h, at 150°C, and a partial isobutylene pressure of about 300 torr. The experimental results obtained (Table 3) show that with a variation of acidity by five orders of magnitude, the dimerization rate varies by the fivefold only. The degree of dimerization (with respect to isobutylene) amounts to 1.6 on silicon zirconium- and aluminosilicate catalysts at 150°C. This low dependence of the reaction rate on acidity shows that the isobutylene adsorbed on the catalyst surface is almost completely "protonized" (Table 4). A comparison with data from publications concerning the dimerization of isobutylene on phosphoric acid films leads to the assumption that the "protonization" of the adsorbed isobutylene takes place more readily than that of the dissolved one.

G. K. Boreskov is finally thanked for his discussions. B. A. Kazanskiy, M. I. Rozengard, and N. M. Chirkov are mentioned in the text. There are 4 figures, 4 tables, and 13 references: 7 Soviet, 3 US, 2 British, and 1 French.

4

Card 2/3

Effect of the Acidity of Catalysts on Their  
Catalytic Activity I. Polymerization of  
Isobutylene

82655  
S/195/60/001/001/005/007  
B015/B060

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova  
(Physicochemical Institute imeni L. Ya. Karpov)

SUBMITTED: December 30, 1959

✓

Card 3/3

BORESKOV, G.K.; DZIS'KO, V.A.; PSIKUNOVA, Ye.M.; YUR'YEVA, T.M.

Silicon-boron-tungsten catalyst for the hydration of ethylene. Khim.  
prom. no. 2:97-101 F '61. (MIRA 14:4)  
(Ethylene) (Hydration) (Catalysts)

S/195/61/002/001/005/006  
B101/B216

AUTHORS: Makarov, A. D., Boreskov, T. K., Dzis'ko, V. A.

TITLE: Chemical composition and catalytic properties of silicon-zirconium catalysts

PERIODICAL: Kinetika i kataliz, v. 2, no. 1, 1961, 84-93

TEXT: Basing on the fact that the catalytic properties of oxide mixtures are not additive, the present work studies the chemical nature and catalytic properties of silicon-zirconium catalysts, and whether this deviation from additivity is due to different acceleration of the individual reactions by the components (a view held, e.g., by B. B. Corson, et al., Ref. 1, see below), or to the chemical nature of the catalyst being changed by interaction between the two components. The following catalysts were prepared: (1) Silica gel by hydrolysis of the ethyl ester of orthosilicic acid, and ignition of the precipitate at 500°C; (2) ZrO<sub>2</sub> by precipitation of ZrOCl<sub>2</sub> with NH<sub>3</sub>, and ignition of the precipitate at 500°C; (3) mixed catalysts by joint precipitation of ZrOCl<sub>2</sub>

Card 1/11

S/195/61/002/001/005/006  
B101/B216

Chemical composition and ...

and the orthosilicic acid ester with  $\text{NH}_3$  from aqueous-alcoholic solution, hydrolysis of the precipitate, and ignition; component ratios of the mixture and temperature of ignition were varied; (4) mechanical mixtures of the two components. The structure of the Si-Zr catalysts was examined by (A) X-ray analysis. Results obtained were: (a)  $\text{ZrO}_2$  crystallizes at  $400-450^\circ\text{C}$  in the tetragonal variety which at  $500^\circ\text{C}$  passes over to the monoclinic variety; (b) silica gel ignited at  $1000^\circ\text{C}$  is amorphous; (c) jointly precipitated Si-Zr mixtures containing up to 15%  $\text{SiO}_2$  after ignition at  $500^\circ\text{C}$  exhibited the structure of a solid solution which decomposed after ignition at  $1000^\circ\text{C}$  and was re-formed when the temperature dropped below  $1000^\circ\text{C}$ . (B) Infrared spectrometric analysis in an  $\text{N}_2\text{L}-2$  (IKS-2) spectrometer in the range  $2000-600 \text{ cm}^{-1}$  gave the following results: (a) Silica gel shows absorption bands at 1170, 1100, and  $810 \text{ cm}^{-1}$ ; (b)  $\text{ZrO}_2$  one at  $735 \text{ cm}^{-1}$ ; (c) the spectra of mechanical mixtures were additive; (d) samples obtained by joint precipitation had different spectra

Card 2/11

S/195/61/002/001/005/006  
B101/B216

Chemical composition and ...

than the initial substances: the 735 and 810  $\text{cm}^{-1}$  bands disappeared, and new bands appeared at 1060 and 960  $\text{cm}^{-1}$ . The formation of an approximately equimolar chemical compound from the two components was established.  $\text{ZrO}_2$  contained approximately 0.5% of structure water, silica gel, about 1%, and the jointly precipitated equimolar sample, 3%. Acidity was determined from the color change of an indicator, and the number of acid groups on the surface by titration with butyl amine. Silica gel and  $\text{ZrO}_2$  are only slightly acidic, producing a color change of the acid indicator at  $\text{pK} = 4$ . The  $\text{SiO}_2\text{-ZrO}_2$  samples produced a color change at  $\text{pK} = -8.2$ . The catalytic activity was measured in a continuous-flow apparatus for the following reactions: (I) Preparation of divinyl from a mixture of 72.1% ethyl alcohol, 21.7% acetal, and 6.2%  $\text{H}_2\text{O}$  at 340°C. Table 1 shows the results obtained with the pure components and their mechanical mixtures, Table 2 the results for  $\text{SiO}_2\text{-ZrO}_2$  catalysts, and Table 3 those obtained with these catalysts after treatment with water vapor. (II) Decomposition of ethyl alcohol (Table 4) and isopropyl

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alcohol. (III) Condensation of acetal (Table 5). The results obtained were: (a) The non-additive catalytic properties of jointly precipitated Si-Zr catalysts were confirmed. This non-additivity is due to chemical combination of the components. (b) The number of acid groups on the surface of the equimolar sample and its catalytic activity decrease on heating to 800°C. In dehydration of ethyl alcohol, its catalytic activity is proportional to the acidity. (c) The condensation of acetal does not depend on the temperature to which the catalyst was heated. (d) The dehydration of aldol, as of alcohols, takes place at the OH groups on the catalyst surface and, therefore, decreases after ignition of the catalyst. The authors thank L. A. Ignat'yeva and Z. T. Orlova for taking and evaluating the spectra, and M. S. Borisova and M. V. Kostyukova for the acidity measurements. There are 6 figures, 5 tables, and 11 references: 5 Soviet-bloc and 6 non-Soviet-bloc. The references to English-language publications read as follows: B. B. Corson, H. E. Jones, Welling, Hinckley, E. E. Stahly, Ind. Eng. Chem., 42, 359, 1950; R. E. Geller, Lang, J. Amer. Ceram. Soc., 32, (12 Part. II) 167, 1957.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova  
Card 4/11 (Physicochemical Institute imeni L. Ya. Karpov)

S/195/61/002/001/005/006  
B101/B216

Chemical composition and ...

SUBMITTED: November 12, 1960

Legend to Table 1: (1) sample number, (2) composition of the catalyst, (3) temperature at which 2-hr heat treatment was performed, °C, (4) yields of main reaction products, mol%; (a) ethylene, (b) hydrogen, (c) divinyl; (5) crystal structure, (6) mechanical mixture, (7) ditto, (8) monoclinic, (9) tetragonal, (10) amorphous, (11) traces.

Таблица 1

Разложение спирто-альдегидной смеси на  $ZrO_3$ ,  $SiO_2$  и их механических смесях

(1) № образ- ца	(2) Состав катали- затора, мол. %		(3) Термическая обработка в течение 2 ча- сов при темпе- ратуре, °C	(4) Выход основных продуктов реакции, мол. %			k/S, моль ж <sup>2</sup> сек	Кристаллические формы (5)
	$ZrO_3$	$SiO_2$		этан	водород	дивинил		
1	100	—	500	10,0	14,0	5,0	0,4	Моноклинная
2	100	—	450	8,0	13,0	7,0	0,6	Тетрагональная
3	100	—	300	8,5	11,9	6,0	0,5	Аморфная
4	—	100	500	12,0	2,0	21,0	0,08	Аморфная
5	31,4	68,6	(Механиче- ская смесь)	7,0	4,0	Следы	0,1	Аморфная
6	66,2	33,8	То же	9,0	10,3	3,0	0,3	

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Разложение спирто-алкилдиоксий си-  
карбоната

## Chemical composition and ...

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B101/2216

Legend to Table 2: (1) sample number, (2) composition of catalyst, (3) heat treatment; (a) temperature, (b) duration, hr, (4) yields of main reaction products, mole%; (a) ethylene, (b) divinyl; (5) crystal structure, (6) amorphous, (7) solid solution.

(1)	Состав катализатора, мол. %	ZrO <sub>2</sub>	SiO <sub>2</sub>	Термостабильность сорбции			Быстро-нестабильная прореакция генерации, час. %	При- емка (3)	(4)
				Темп., °C	Время, час.	При- емка (3)			
1	92,5	7,5	425	212	2,0	4,0	36,0	—	—
2	92,5	7,5	500	212	2,0	30,0	—	—	—
3	85,0	15,0	435	212	2,5	43,0	—	—	—
4	85,0	15,0	500	212	2,5	38,0	—	—	—
5	85,0	15,0	1200	212	0,0	58,0	—	—	—
6	66,2	33,8	700	212	1,5	40,0	—	—	—
7	68,2	33,8	750	212	6,0	64,0	—	—	—
8	85,0	15,0	500	212	5,0	67,0	—	—	—
9	50,0	50,0	500	212	5,0	48,5	—	—	—
10	50,0	50,0	800	212	2,5	66,0	—	—	—
11	45,0	55,0	500	212	2,5	49,0	—	—	—
12	45,0	55,0	800	212	2,5	67,0	—	—	—
13	10,0	90,0	500	212	2,5	49,0	—	—	—
14	10,0	90,0	850	212	10	67,0	—	—	—

CCS на армепирокиновые  
атомах

S. № (1)	n. состав катализатора	n. состав катализатора	Кристаллическая форма (3)	
			n/S × 10 <sup>3</sup> , моль атом/атом	—
100,0	5,0	5,0	5,0	Аморфная
98,2	5,4	5,5	5,5	Аморфная + + гидрат P-P?
120,2	6,0	5,0	5,0	Аморфная
111,0	5,0	4,5	4,5	Аморфная + гидрат P-P?
15,6	—	—	—	Гидрат P-P?
160,2	3,4	2,1	2,1	Аморфная
132,0	2,5	1,9	1,9	Аморфная + гидрат P-P?
180,0	3,2	1,8	1,8	Аморфная
174,0	3,3	1,9	1,9	Аморфная
151,0	2,2	1,5	1,5	Аморфная
163,0	2,2	1,2	1,2	Аморфная
148,0	1,6	1,1	1,1	Аморфная
134,3	0,9	0,67	0,67	Аморфная + гидрат P-P?
109,2	0,5	0,46	0,46	Аморфная + гидрат P-P?

Chemical composition and ...

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Legend to Table 3: (1) sample number, (2) composition of catalyst, mole%,  
(3) yields of main reaction products, mole%; (a) ethylene, (b) divinyl;  
(4) heat treatment; (c) temperature, (d) duration, hr, (5) preset  
conditions for treatment with water vapor, (6) crystal structure,  
(7) resinified, (8) ditto, (9) untreated, (10) solid solution, (11) amorphous,  
(12) samples, (13) solid solution.

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Таблица 3  
Влияние обработки водяным паром на избирательность действия кремнециркониевых катализаторов в реакции распада спирто-альдегидной смеси

№	Состав катализатора, мол. %		Выход основных продуктов, реакции, мол. %		Термическая обработка		Условия обработки водяным паром		Кристаллическая форма
	ZrO <sub>2</sub>	SiO <sub>2</sub>	этанол	диоксид	температура, °C	время, час	температура, °C	время, час	
1	85,0	15,0	Дисмоляется		1200 700	2 2	Не обработан		Твердый р-р.
2	85,0	15,0	То же		1200 700	2 2	470 2		То же
3	50,0	50,0	5,0	97,0	500	2	Не обработан		
4	50,0	50,0	2,5	58,0	700	2	То же		
5	50,0	50,0	4,0	66,0	700	2	470 2		
6	10,0	90,0	5,0	66,0	500	2	Не обработан		
7	10,0	90,0	2,0	57,0	750	5	То же		
8	10,0	90,0	2,0	57,0	750	5	200 6		
9	10,0	90,0	2,5	60,0	750	5	330 2		
10	10,0	90,0	2,5	62,0	750	5	370 2		
11	10,0	90,0	3,0	66,0	750	5	400 2		
12	10,0	90,0	2,0	50,0	850	10	Не обработан		Аморфная + твердый р-р.
13	10,0	90,0	4,0	50,0	850	10	400 2		(образцы 3-11)
14	10,0	90,0	4,0	50,0	850	10	470 2		(образцы 12-14)

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Chemical composition and ...

Legend to Table 4: (1) sample number, (2) composition of catalyst, (3) heat treatment; (a) temperature, (b) duration, hr, (4) yields of main products, mole%, (c) ethylene + ether, (5) calculated for formation of chemical compound, (6) crystal structure, (7) mechanical mixture, (8) was not determined, (9) inactive, (10) monoclinic, (11) tetragonal, (12) amorphous, (13) samples, (14) solid solution, (15) well crystallized solid solution.

Таблица 4

## Разложение этилового спирта при 340°

(1) нр	(1) Состав катали- затора, мол. %		(2) Термическая об- работка		(3) Выход основных продуктов раз- щепления, мол. %		(4) A/S·10 <sup>4</sup> , моль м <sup>2</sup> ·см <sup>2</sup>	(5) A/S·10 <sup>4</sup> в расчете на хими- ческое сое- динение, моль м <sup>2</sup> ·см <sup>2</sup>	(6) Кристаллическая форма
	ZrO <sub>2</sub>	SiO <sub>2</sub>	температу- ра, °C	время, час	этанол+ водород	H <sub>2</sub>			
1	100	—	500	2	58,0	33,0	4,2	—	Моноклинная
2	100	—	450	2	57,0	32,0	4,5	—	Тетрагональная
3	100	—	300	2	57,0	34,0	4,7	—	Аморфная
4	31,9	68,1	Механическая смесь	Не определялись	—	—	1,0	—	
5	—	100	500	2	100	—	0,7	—	

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B101/B216Table 4  
CONT.

6	92,5	7,5	425	2	100	—	8,4	5,5	④ Образцы 6-11: аморфные
7	85,0	15,0	435	2	100	—	18	0,0	
8	68,1	31,9	500	2	100	—	32	5,0	
9	50,0	50,0	500	2	100	—	53	5,3	
10	45,0	55,0	500	2	100	—	50	5,5	
11	10,0	90,0	500	2	100	—	10	5,0	
12	92,5	7,5	500	2	100	—	0,0	4,3	④ Образцы 12-17:
13	85,0	15,0	500	2	100	—	12	4,0	④ аморфные +
14	68,1	31,9	750	2	100	—	28	4,3	④ твердый р-р
15	50,0	50,0	800	3	100	—	38	3,8	
16	45,0	55,0	800	3	100	—	29	3,2	
17	10,0	90,0	850	10	100	—	7,0	3,5	
18	85,0	15,0	1200	2	100	—	—	—	
			700	2	Не активен	④			

Хорошо окри-  
стализован-  
ный твердый  
р-р

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B101/B216

Chemical composition and ...

Legend to Table 5: (1) sample number, (2) composition of samples, (3) heat treatment, (a) temperature, (b) duration, hr, (4) yield of croton aldehyde at various degrees of conversion, mole%, (5) crystal structure, (6) monoclinic, (7) amorphous, (8) solid solution.

Таблица 5

## Конденсация уксусного альдегида

(1) образца	(2) Состав образ- цов, % мол.		(3) Термическая обработка		(4) Выход кротонового альдегида при различ- ных степенях превра- щения, % мол.			h/S·10 <sup>3</sup> , моль м <sup>2</sup> ·сек	(5) Кристаллическая форма
	ZrO <sub>2</sub>	SiO <sub>2</sub>	(a) тепло- ротура, °C	(b) время, час	10	25	35		
1	100	—	500	2	100	87,0	50,0	8,25	Моноклинная
2	—	100	500	2	100	91,0	78,0	0,4	Аморфная ②
3	10,0	90,0	500	2	100	92,0	80,0	9,6	Аморфная ③
4	10,0	90,0	850	10	100	80,0	—	9,2	Твердый p-p+аморфная ④
5	55,0	45,0	500	2	100	94,0	78,0	49,0	Аморфная ⑤
6	85,0	15,0	500	2	—	70,0	62,0	61,0	Твердый p-p+аморфная ⑥

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S/020/61/136/001/026/037  
B004/B056

AUTHORS: Boreskov, G. K., Corresponding Member AS USSR, Dzis'ko, V.A.,  
and Tyulikova, T. Ya.

TITLE: The Effect of Water and Oxygen on the Polymerization of  
Ethylene Upon Chromium Oxide Catalysts

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1,  
pp. 125-128

TEXT: Greatly differing data of the efficiency of chromium oxide catalysts in ethylene polymerization (Refs. 1-3) gave rise to the present paper. Impurities are assumed to have an effect. The present paper gives an account on the effect of water and oxygen on polymerization. The catalyst was made of aluminosilicate carrier, bulk weight 0.43, pore radius 40-60 Å, surface  $300 \text{ m}^2/\text{g}$ . This base was impregnated by chromic acid, dried at  $110^\circ\text{C}$ , heated to  $250^\circ\text{C}$ , and activated by 4 hours' heating to  $400^\circ\text{C}$  at  $10^{-3}$  torr. The finished catalyst contained 5%  $\text{Cr}_2\text{O}_3$ . Primarily, experiments were made with extremely pure ethylene. Purity was attained by

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The Effect of Water and Oxygen on the Polymerization of Ethylene Upon Chromium Oxide Catalysts

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B004/B056

✓

passing  $C_2H_4$  at a pressure of 50 atm through carbon filters, through a column with nickel-chromium catalyst (for  $O_2$  removal), and through columns with active  $Al_2O_3$  (removal of water). The solvents,  $BP-1$  ( $BR-1$ )-type gasoline, cyclohexane or heptane were also freed from water and oxygen by  $Al_2O_3$  and blowing-through of  $N_2$ . Purified  $C_2H_4$  contained about 5 parts-per-million  $O_2$  and  $H_2O$ , the solvents contained about 5 parts-per-million  $H_2O$ . Polymerization took place in a stainless steel autoclave of 1 liter volume. Special measures (breakoffski for catalyst-containing ampoule, magnetic mixer) prevented access of impurities during the reaction. Processing was as follows: Heating of autoclave to  $200^\circ C$ , evacuation for two hours, cooling down to  $100^\circ C$ , repeated blowing-through of pure  $C_2H_4$ . Subsequently, 300 g of purified solvent were pressed into the autoclave by means of  $N_2$ , followed by  $C_2H_4$  addition up to a pressure of 35 atm. Curves I of Fig. 2 (polymer yield versus catalyst concentration) and Fig. 3

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The Effect of Water and Oxygen on the Polymerization of Ethylene Upon Chromium Oxide Catalysts

S/020/61/136/001/026/037  
B004/B056

(efficiency of the catalyst versus its concentration) illustrate the results obtained with pure  $C_2H_4$ . Curves II were obtained for higher water content (20 parts-per-million). Fig. 4 shows the effect of oxygen upon the efficiency of the catalyst. It is assumed that the impurities are adsorbed on the catalyst and thus obstruct its activity centers. The authors thank B. A. Lipkind, Chief Engineer of the Gor'kovskaya baza NIINP (Gor'kiy Base of the Scientific Research Institute of the Petroleum Industry) for supplying the carrier samples. There are 4 figures and 5 references: 2 Soviet and 1 Belgian.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Institute of Physical Chemistry imeni L. Ya. Karpov)

SUBMITTED: August 17, 1960

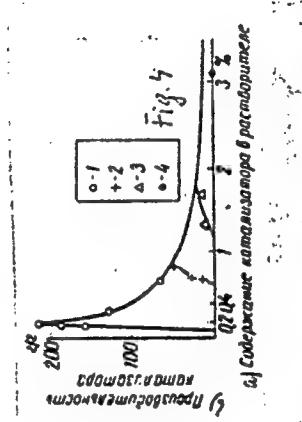
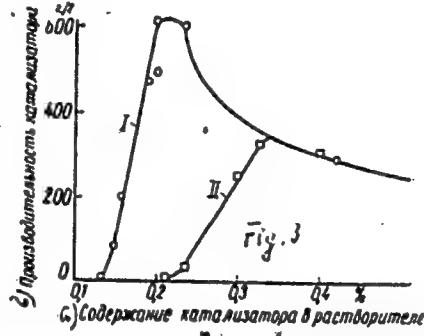
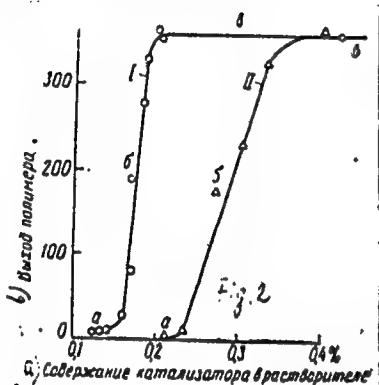
Legend to Fig. 2: I: Water content in the solvent 5 parts-per-million. II: Water content in the solvent 20 parts-per-million; a) content of catalyst in the solvent, b) polymer yield.

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Legend to Fig. 3. I: Water content in the solvent 5 parts-per-million; II: water content in the solvent 20 parts-per-million; a) content of catalyst in the solvent, b) efficiency of the catalyst.

Legend to Fig. 4. Oxygen content in ethylene 1: 0.0003%; 2: 0.001%, 3: 0.01% 4: 0.1%; a) content of catalyst in the solvent, b) efficiency of the catalyst.



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S/020/62/143/005/014/018  
B101/B110

AUTHORS: Yermakov, Yu. I., Boreskov, G. K., Corresponding Member  
AS USSR, Dzis'ko, V. A., and Ivanova, L. I.

TITLE: Low-temperature polymerization of ethylene on chromium oxide catalyst

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 5, 1962,  
1139-1141

TEXT: The polymerization of ethylene at 75°C, i.e., below the m.p. of the polymer, on a chromium oxide catalyst, whose preparation has been described earlier (DAN, 136, no. 1, 125 (1961)), is discussed. The experiments were made with high-purity C<sub>2</sub>H<sub>4</sub> (1-2 ppm O<sub>2</sub>, 3 ppm H<sub>2</sub>O) in purified n-heptane at constant pressure (5-15 atm). The following results were obtained (Fig. 1): (1) an induction period was observed (30-150 min), which was shorter at higher pressure and higher concentration of the catalyst; (2) after the induction period the reaction rate remained constant for a long time (at low catalyst concentration up to

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Low-temperature polymerization ...

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20 hrs); (3) the polymer consisted of 0.2 to 3 mm large granulae; (4) the initial grains of the catalyst had a size of 0.5 to 1 mm. Catalyst particles of  $1-10 \mu$  were found on the surface (not in the bulk) of the polymer grains; (5) a threshold concentration of the catalyst exists below which there is no polymerization. Hence no polymerization occurred with 0.0274% catalyst in the solvent, and a slight polymerization with 0.0325%; (6) the activity, A, of the catalyst, depends on the pressure, P;  $A = aP^n$  ( $a, n$  = constants). At  $< 9$  atm,  $n \sim 2$ , at 11-15 atm,  $n \sim 3$ ; (7) the molecular weight, MW, is independent of the catalyst concentration, but depends on P: at 9 atm, the MW was 110,000-125,000, at 15 atm, the MW was 400,000-600,000; (8) a maximum yield (1800 g polyethylene per g catalyst) was obtained at 15 atm and 0.0520% catalyst concentration. There are 4 figures and 1 table.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova  
(Physicochemical Institute imeni L. Ya. Karpov)

SUBMITTED: January 11, 1962

Card 2/3

Low-temperature polymerization ...

S/020/62/143/005/014/018  
B101/B110

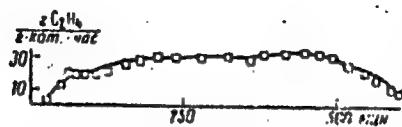


Fig. 1: kinetic curve of  $\text{C}_2\text{H}_4$  polymerization at 9 atm,  $75^\circ\text{C}$ , catalyst concentration 0.336%. Legend: abscissa time, min; ordinate  $\text{g} \text{C}_2\text{H}_4/\text{g catalyst} \cdot \text{hr}$ .

Card 3/3

DZIS'KO, V.A.; BORISOVA, M.S.; KOTSARENKO, N.S.; KUZNETSOVA, E.V.

Effect of the acidity of oxide catalysts on their catalytic activity. Part 2: Dehydration of isopropyl alcohol. Kin.i  
kat. 3 no.5:728-733 8-0 '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.  
(Isopropyl alcohol) (Dehydration (Chemistry))  
(Catalysis)

BORISOVA, M.S.; DZIS'KO, V.A.; CHEREDNIK, Ye.M.

Effect of the acidity of oxide catalysts on their catalytic activity. Part 3: Dimerization of propylene. Kin.i kat. 3 no.5:734-741 S-0 '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Fiziko-khimicheskiy institut imeni Karpova.  
(Propene) (Polymerization) (Catalysis)

YERMAKOV, Yu.I.; BORESKOV, G.K.; DZIS'KO, V.A.; IVANOVA, L.I.; TRIFONOV,  
A.S.

Polymerization of ethylene on a chromia catalyst without a solvent. Khim.prom. no.7:496-498 Jl '63. (MIRA 16:9)

BORISOVA, M.S.; DZIS'KO, V.A.; IGNAT'YEVA, L.A.; TIMOFEEVA, L.N.

Acidity of hydroxyl groups of oxide catalyst surfaces  
studied by means of infrared spectroscopy. Kin. i kat. 4 no.3:  
461-466 My-Je '63. (MIRA 16:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,  
fizicheskiy fakul'tet i Fiziko-khimicheskiy institut imeni  
Karpova.

(Catalysts) (Hydroxyl group)  
(Spectrum, Infrared)

L 1C702-63

EWP(j)/EPF(c)/EWT(m)/RDS--ASD--Pc-1/Pr-1--<sup>PM/WW</sup>

ACCESSION NR: AP3002024

S/0195/63/004/003/0492/0494

AUTHOR: Bukanayeva, F. M.; Boreskov, G. K.; Dmis'ko, V. A.TITLE: Investigation of the chromium oxide catalyst for high polymerization of ethyleneSOURCE: Kinetika i kataliz, v. 4, no. 3, 1963, 492-494TOPIC TAGS: chromium oxide, CrO<sub>3</sub> catalyst, polyethylene, catalyst carrier, activated CrO<sub>3</sub>

ABSTRACT: The conditions for activating CrO<sub>3</sub> for production of polyethylene were investigated: CrO<sub>3</sub> concentration, nature of carrier, reactivity with solvents. Pure CrO<sub>3</sub> is completely dissociated at 400 degrees, while with 5% CrO<sub>3</sub> on silica gel, Al or Mg silicate at the same temperature 90% is still in the hexavalent state and at 800 degrees, 30% of the Cr is still hexavalent. Increasing CrO<sub>3</sub> from 5 to 20% on the carrier decreases its activity, apparently because of decrease in dispersibility. CrO<sub>3</sub> on a carrier is most rapidly reduced in methycyclohexane, moderately reduced by cyclohexane and n-heptane and least in benzene; pure CrO<sub>3</sub> does not react with heptane due to formation of layer Cr<sub>2</sub>O<sub>3</sub>. When activated CrO<sub>3</sub> catalyst is treated with solvent,

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polymerization induction period is prolonged (to provide for desorption of solvent-reaction products from catalyst surface), but catalyst activity is actually increased. EPR spectra of activated and of activated cyclohexane-treated catalyst show same signal intensity, presuming same amount of reduction to Cr<sup>+</sup>5. Hence solvent does not participate in formation of active component of the catalyst; catalyst activation is determined by surface combination of the Cr with the carrier. "NPR spectra were taken at the Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)." Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: Institut kataliza SO AN SSSR (Catalyst Institute, Siberian Department of the Academy of Sciences SSSR)

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Catalytic activity and electron paramagnetic spectra of  
molybdenum oxide catalysts for the polymerization of ethylene.  
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(Molybdenum catalysts—Spectra)  
(Polymerization)